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ABSTRACT

The Technological Baccalaureate (TechBac) is a new award that aims to achieve parity of status between academic and vocational qualifications in England. It is designed primarily to be awarded to people aged 18-19. The number of British students who stay in full-time education at 16 is lamentably below figures for other advanced countries. In England, 60% of children leave full-time education at 16; in Japan 4%; and in Germany and the USA about 10%. Since it is based on achievements rather than courses, evidence from different experiences, including work, can be used to satisfy its requirements. This makes the TechBac suitable for mature students. Credit can be transferred from training courses, work experience, or awards of other bodies. Units of credit obtained via assessment for TechBac can be transferred to any occupational or academic award to which they are relevant. Certification is available at three levels. It has a four-part curriculum specification, including a common core of technological and communication units. Students must complete various sections to obtain different levels of certification. Students may choose whatever emphasis--academic, technical, vocational, or artistic--is appropriate to their talents and intended occupational areas. Learning is related to the technological design process and the individual's target level of qualification; the acquisition of knowledge is always related to learning "how to." The TechBac framework draws upon existing and proposed national qualifications and provides an entry point into further education, higher education, training, or employment. (Appendixes include a list of occupational areas within the TechBac and questions and answers.) (YLB)

The C&G Technological Baccalaureate

Developed jointly by City and Guilds, the CTC Trust and four CTCs

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Abbreviations

BTEC	Business & Technician Education Council
C&G	City and Guilds of London Institute
GCSE	General Certificate of Secondary Education
GNVQ	General National Vocational Qualification
NCVQ	National Council for Vocational Qualifications
NVQ	National Vocational Qualification
RSA	RSA Examinations Board
TVEI	Technical and Vocational Education Initiative

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Summary

The Technological Baccalaureate (TechBac) is a new award which aims to achieve parity of status between academic and vocational qualifications. It was developed jointly by the City and Guilds of London Institute (C&G), the CTC Trust and four CTCs: Brooke CTC, Corby; Dixons Bradford CTC, Bradford; Djanogly CTC, Nottingham; Harris CTC, Croydon. The TechBac is designed primarily to be awarded to people aged 18-19, but since it is achievements-driven rather than courses-driven, evidence from a wealth of different experiences, including work, can be used to satisfy its requirements; therefore the TechBac is also suitable for mature students.

The TechBac framework draws upon existing and proposed national qualifications and provides an entry point into further education, higher education, training or employment. It has a four-part curriculum specification, including a common core of technological and communication units.

Certification is available at three levels:

1. TechBac (equivalent to GNVQ level 2);
2. TechBac with Credit (equivalent to GNVQ level 3, or 2 'A' levels plus skills from the common core);
3. TechBac with Distinction (equivalent to 3 'A' levels plus skills from the common core).

The award uses a system of credit transfer. Credit can be transferred from training courses, work experience or awards of other bodies including GSCE, RSA, C&G and BTEC. Similarly, units of credit obtained via assessment for the TechBac can be transferred to any occupational or academic award to which they are relevant. To facilitate this credit transfer, each student has a separate Record of Achievements which documents all units of credit which have been completed successfully.

In this country, there has been a tendency to regard subjects as 'academic' or 'vocational'. In reality, any subject may be approached from a number of perspectives: academic, technical, vocational or artistic. The TechBac recognizes this and allows students to choose whatever emphasis is appropriate to their talents and intended occupational areas. Learning is related to the technological design process and the individual's target level of qualification; the acquisition of knowledge is always related to learning 'how to'.

Traditionally, students have been forced to specialize in one particular area and once the choice has been made, it cannot be altered without starting again. The TechBac, on the other hand, allows options to be kept open by providing a mechanism to bridge the academic/vocational divide and flexibility in which credits already achieved cannot be 'lost'.

A pilot scheme for delivering the TechBac is running during the 1991/92 academic year.

I. Introduction

Why do we need another new qualification?

The Technological Baccalaureate, or TechBac for short, answers many of the problems which have been identified with post-16 education in this country. It provides a sound technological framework within which to explore students' chosen subjects and occupational areas. Someone wishing to specialize in Music, French or Business and Finance will find as much for them in the TechBac as someone wishing to follow a technological career in industry, commerce, public service or self-employment.

Its uniqueness is summarized by the following points:

- The TechBac dispels the notion that academic achievement is somehow intrinsically more valuable than vocational achievement;
- The TechBac manifestly combines academic rigour and vocational competence;
- The TechBac provides for a wide ability range and maximizes each ability;
- The TechBac recognizes the same high level of ability and achievement across a wide range of quite different aptitudes;
- A TechBac certificate gives a clear statement of what the student has done and can do;
- The TechBac provides a coherent framework in which to fit all relevant qualifications;
- The TechBac acknowledges the fact that each student is different. Each subject is studied in a context and from a perspective which relates to the student's chosen occupational area and level of qualification.

This briefing paper is being issued by the CTC Trust to present a concise overview of this new and exciting initiative. It is aimed at people who are in a position to influence educational policy both nationally and locally, and at those who advise students about suitable courses. Full details of the TechBac are contained in the Technological Baccalaureate Scheme Pamphlet which is available from the Sales Section, City and Guilds of London Institute, 76 Portland Place, London W1N 4AA, Telephone 071 278 2468, stock number SP-00-3621, price £5.00 including postage.

II. Background

The number of British students who stay in full-time education at 16 is lamentably below figures for other advanced countries. In Britain, 60% of children leave full-time education at 16; in Japan the figure is 4% and in Germany and the USA it is about 10%.[1] To make the problem worse, approximately 40% of British 16 year olds leave school without even one grade 'C' pass at GCSE.[2] This

1 Figures quoted from *Education and the Labour Market: An English Disaster*, by Adrian Wooldridge, published by The Social Market Foundation, 1990. An ACC/AMA survey carried out in November 1990 indicated that 53% of British 16 year olds stayed on in full-time education. This is clearly an improvement, but the situation still compares unfavourably with that of our competitors.

2 According to the report *Secondary schools, an appraisal by HMI* from the Department of Education and Science, 1988.

adversely affects British industry which desperately needs skilled labour but finds it difficult to recruit adequately educated and trained workers.

The problems besetting post-16 education and training in this country are being discussed widely. This discussion has led to recognition of the need for:

- Continuity and progression from the age of 16, especially where technical and vocational courses are involved;
- A single coherent framework which brings together academic and vocational qualifications in a way which achieves parity of status between them;
- An understanding of the technological approach to problem-solving in industry, commerce and the market environment;
- Improvement of the staying-on rate in full-time education or training for students over the age of 16;
- Training of more workers to equip them with the skills necessary to co-operate and compete in the single market of the European Community and elsewhere in the world.

The TechBac was developed jointly by C&G and the CTC Trust in order to tackle these problems. Four CTCs joined the development early on and have played a crucial role. These are Brooke CTC in Corby, Djanogly CTC in Nottingham, Harris CTC in Croydon and Dixons Bradford CTC in Bradford. The second stage of development and piloting also involves, at their own request, schools and colleges in the Bromsgrove and Redditch TVEI Consortium.

These pilot institutions wanted an award which would satisfy the problems listed above, and also allow them to:

- Ensure that their students become people who can do things as well as know about them, i.e. people with skills as well as knowledge;
- Help their students to choose and prepare for the right qualifications;
- Keep students' options open as long as possible;
- Help them change or refine their options without having to go back to square one;
- Provide a curriculum for a wide range of ability.

As with other C&G awards, wide consultation with leading industrialists, union representatives, educators and public officials was undertaken, via the City and Guilds Policy Committee for Education and Training. This committee said that provision must include the following:

- A means of entry to higher education or further education;
- Sufficient breadth;
- A means of transfer between itself and both academic and vocationally- specific schemes;
- A coherent curricular package and a name which is instantly recognizable;
- An emphasis on the physical, mental and social skills and knowledge which support and extend technical, commercial and industrial standards of competence;
- Relevance to a progressive career with or without ties to a specific occupation.

Careful consideration was given to all of these points in the development of the TechBac. One of the most important aspects of the award is the flexibility it offers through the use of a system of credit transfer.

III. Credit transfer

Traditional courses, particularly post-16 courses in schools, have been directed towards obtaining a specific qualification. A student who wanted to change courses half way through was therefore obliged to start again. That would not happen under the TechBac framework because it uses a system of credit transfer. Full recognition would be given to the student's past study and experience, and no previous achievements would be 'lost'.

Credit transfer is made possible by two things:

1. Each part of the TechBac curriculum is defined in terms of units, elements, performance criteria and ranges;
2. Each student has a Record of Achievements which documents all units which have been completed successfully.

Since requirements for each unit of the award are expressed as criteria for measuring achievement, evidence from any source may be used to fulfill those criteria, including courses specifically designed for the TechBac and awards from other bodies. Therefore if a student already has some qualifications or work experience, this evidence can be submitted for TechBac assessment. Successful completion of a unit is written into the student's Record of Achievements. Credits from TechBac courses can be transferred to other relevant qualifications.

Thus, the TechBac is a mechanism for moving between progression routes and retaining credit for previous achievements; it does not replace or compete with existing qualifications.

IV. The structure of the TechBac

The TechBac concept is derived from the British experience except in one very important aspect: it rejects the British practice of regarding some subjects as 'academic' and others as 'vocational'. Instead, it adopts the Continental view that all subjects can be studied according to academic, technical, vocational or artistic traditions, and can draw evidence of achievement from academic, technical, vocational or artistic study or activity.

Certification is available at three levels:

1. TechBac (equivalent to GNVQ level 2);
2. TechBac with Credit (equivalent to GNVQ level 3, or 2 'A' levels plus core skills);
3. TechBac with Distinction (equivalent to 3 'A' levels plus core skills).

The curriculum

The TechBac has a four-part curriculum, outlined below. To obtain a TechBac certificate, the student must complete Sections A and B. This corresponds to a GNVQ at level 2.

To obtain the TechBac with Credit, the student must complete Sections A, B and Da. This corresponds to a GNVQ at level 3.

To obtain the TechBac with Distinction, the student must complete Sections A, B and Db with three subjects passed to a standard equivalent to 'A' level or BTEC National Diploma. This provides for entry to higher education and subsequent progression to GNVQ levels 4 and 5.

Section C of the curriculum forms a supplement to Section B and allows for a broad, balanced qualification. It is not demanded for the TechBac award, but studies within Section C can be extended to 'A' level standard within Section D towards gaining the TechBac with Distinction. All credits obtained under Section C are listed on the Record of Achievements.

Section A
Students are guided to explore and develop their individual potential so that the rest of their TechBac study can be tailored to their specific needs and aspirations.

The broad framework of occupational functions devised for NVQs, listed in Appendix A, is used to determine the following:

a. The career area most suitable for the individual student, e.g. engineering, transporting, communication and entertaining and so on;

b. The target level of qualification most suitable for the individual student;

c. The technological context(s) within which study and assessment will take place, e.g. office, factory, building site and so on.

From these, an action plan for personal progression is established.

Section B
This is the core of the TechBac, containing a common curriculum followed in the occupational context identified in Section A; it is composed of 7 sections.

B1 The Technological Design Process.

This is the technological way of solving problems. A student is required to carry out occupationally-related projects to discover what outcome is required, make plans to achieve that outcome, try them out and then produce the outcome. The life-cycle of a product or service consists of marketing, design, production, testing, distribution and further development phases. The technological problem-solving process parallels this life-cycle.

B2 Key Technologies to support B1.

The following technologies are those which affect the things we do or the way in which we do them in whatever occupational area. A student is required to consider how to use key technologies in the definition, production or distribution of a product or a service and what impact changes in those technologies may have.

B2.1 Materials;
B2.2 Equipment, Tools and Instruments;
B2.3 Technical Processes;
B2.4 Technical and Management Systems;
B2.5 Informatics (Information Technology and Telematics).

B3 Science (18 topics).

Particular emphasis is placed on the application of science for technological purposes. A student is required to understand the basic science underpinning key technologies so that developments and changes within those technologies can be understood.

B4 Measurement and Calculation (Mathematics, Statistics, Mensuration, Instrumentation).

This section helps the student learn how to use calculation and measurement to achieve what is wanted.

B5 Understanding of industry, business and economics.

A student is required to learn how to make the maximum contribution to and gain the maximum advantage from economic activity.

B6 Communication skills in English (written and spoken).

This section involves units for speaking English, writing English and understanding spoken and written English. Graphical forms of text including tables, timetables, graphs, technical drawings and computer programs are within the range of assessment for B6.

B7 Communication skills in one other modern language.

The emphasis in this section of the curriculum is on developing a second language or learning a new language for vocational purposes. Units are geared towards job descriptions and instructions, telephone or tannoy communications, descriptions of maps or diagrams, and other job-specific activities.

A wide variety of existing awards provide evidence which can be used to complete these units. Credit transfer from GCSEs, BTEC First Diplomas and RSA awards as well as examinations set by C&G is possible.

Section C
Student choice of elective courses in the creative or performing arts, the humanities or recreational activities taken at an appropriate level to enhance the students' personal experiences and to complement their studies in Section B or to provide 'A' level equivalents in Section Db.

Section D
An extension curriculum geared to the student's intentions after being awarded the ordinary TechBac. Students who intend to aim for the TechBac with Credit or with Distinction must take either Section Da or Section Db, respectively.

a. The technological skills and knowledge required by a specific GNVQ or NVQ;

b. A selection from Sections B and C taken to a depth which is equivalent to 'A' level standard.

A wide variety of existing awards provide evidence which can be used to complete these units. Credit transfer from 'A' levels, 'AS' levels and BTEC National Diplomas as well as examinations set by C&G is possible.

Assessment

C&G is the awarding body and validates the assessment of the TechBac. C&G sets the criteria for assessment centrally and the student has to provide evidence that these criteria have been met fully. Assessment therefore hinges on providing evidence of achievement; awarding of the TechBac does not depend on a student attending a specified course or sitting specified examinations.

Assessment for courses designed specifically for the TechBac is currently by a mixture of formal end-tests and practical project-based criteria.

Learning style

The TechBac is for people who want to do things as well as know about them. Knowledge is important because it underpins development of the skills needed to create competence. Therefore the acquisition of knowledge is part of the TechBac but the approach to learning is essentially practical, it is always related to the accomplishment of a task or an objective. To this end, learning is related to the technological design process, to the occupational area chosen under Section A of the curriculum, and to the level of qualification each student has as a target.

V. Progression after TechBac certification

Progression routes into other sectors of the national system of education and training which it is possible to follow from the three TechBac certificates are described below.

TechBac
Having been awarded a TechBac at the ordinary level, a student is ready to progress into

- Full-time employment; or
- Further training for employment; or
- Further Education, working towards GNVQ level 3 qualifications.

TechBac with Credit
Having been awarded a TechBac with Credit, a student is ready to progress into

- Full-time employment; or
- Further training for employment; or
- Higher education working towards GNVQ level 4 qualifications.

TechBac with Distinction
Having achieved a TechBac with Distinction, a student is ready to progress into

- Full-time employment; or
- Further training for management or supervisory roles; or
- Higher education working towards a first degree.

VI. Current status

The Policy Committee for Education and Training of the C&G gave formal approval to the offering of the award in April 1991, and it was officially launched on 24th June 1991. A pilot scheme for delivering the TechBac is running during the 1991/92 academic year.

Like all UK qualifications, the TechBac provides evidence of suitability and preparation for work, and because of the consultation and review procedures which were conducted throughout its development, the TechBac already has a wide measure of industrial, commercial and educational currency. Individual CTCs have been approaching local higher education institutions to inform them about the scheme and to ascertain its acceptability for entry onto their courses. So far the response has been favourable.

The TechBac framework is consistent with new and proposed developments in education including the Ordinary and Advanced Diplomas proposed in the government's White Paper *Education and Training in the 21st Century*.

Further development of the TechBac will be driven from two main sources:

1. The results of the pilot scheme evaluation will be used to refine and improve the award as necessary;
2. Further consultation on the government's White Paper may lead to further development of the TechBac.

Appendix A: NCVQ occupational functions

The NCVQ has built a framework of occupational areas which is used to provide a context for study within the TechBac. It lists the following 11 main occupational areas.

1. Tending animals, plants and land;
2. Extracting and providing natural resources;
3. Constructing;
4. Engineering;
5. Manufacturing;
6. Transporting;
7. Providing goods and services;
8. Providing health, social care and protective services;
9. Providing business services;
10. Communication and entertaining;
11. Developing and extending knowledge and skill.

Appendix B: Some questions and answers

- *Why does engineering not feature as a key technology in the TechBac?*

Engineering is an occupational function (number 4 in the NCVQ list on the previous page) involving all key technologies. It does not therefore feature explicitly in the TechBac curriculum as a single key technology. Students who choose engineering as their career area find that, for them, it permeates every section of the common curriculum.

- *How does the TechBac compare with European qualifications?*

C&G conducted research on qualifications in the twelve European Community countries and discovered that subjects were not treated as academic or vocational, but that they could be approached in either way. This approach is reflected in the TechBac, in which a subject can be approached from an academic, technical, vocational or artistic perspective.

A comparison between awards within the European Community countries' qualifications is contained in *Certification Practices in the European Community,* available from the C&G Sales Section, Telephone 071 278 2468, at a price of £15.00 including postage.

- *At what age can a student begin working towards a TechBac?*

Courses leading to the TechBac are designed primarily for the 16-19 age group, but the curricular approach is appropriate for younger students and credit transfer allows achievements to be transferred between award structures. Therefore, students could start collecting credits towards the TechBac at 14 as an alternative to GCSE.

The TechBac is particularly attractive for the mature student since skills and knowledge gained through working experience can be transferred to the Record of Achievements. Someone in mid-career could therefore begin studying for a TechBac certificate knowing that full recognition will be given to his or her experience.

- *Is it possible to be awarded the TechBac solely on achievements from other qualifications such as GCSE, 'A' level, BTEC First Diploma, and so on?*

The TechBac award is based on two things:

1. A curricular approach;
2. A set of very specific criteria for assessment.

Therefore, it is not a course, but a curricular package and credits are not awarded according to whether the student has attended a course, but on whether the student can do a specific collection of things. Anyone who has evidence which meets the specific criteria mentioned above can be awarded a certificate. Therefore, where other qualifications and awards from other bodies meet the requirements of the TechBac units, they can be used as evidence to set against the criteria laid down.

Price £2.50